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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/001,279	11/01/2001	Andrew J. Edwards	50037.56US01	2114

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MICROSOFT CORPORATION
C/O MERCHANT & GOULD, L.L.C.
P.O. BOX 2903
MINNEAPOLIS, MN 55402-0903

EXAMINER

KENDALL, CHUCK O

ART UNIT PAPER NUMBER

2192

DATE MAILED: 09/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/001,279

Applicant(s)

EDWARDS ET AL.

Examiner

Chuck O. Kendall

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2192

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 August 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 08/19/05 has been entered.
2. Claims 1 – 20 have are pending.

Claim Rejections - 35 USC § 103.

3. The following is a quotation of 35 U.S.C. 103(x) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1 - 5 & 8 - 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maebayashi et al. USPN 5,450,589 in view of Berkley et al. USPN 6,351,843 B1.

Regarding claim 1, Maebayashi discloses a computer-implemented method for dynamically modifying an executing heterogeneous program in a distributed computing environment, the method comprising:

obtaining a system reference to an online target system on which the heterogeneous program is executing (2:63 - 67, for reference see address also see Fig 2, 17, 18, 26, and 25, which shows Host, terminal and data processing system addresses and version information is contained in the databases 18 and 30, the terminal is equivalent to target reference), obtaining a program reference to the heterogeneous program based on the system reference (2:65 - 3:5, see working program and holding unit for program reference);

locating a component of the heterogeneous program based on the program reference, the component residing in a target system memory associated with the target system (2:65, see " an address of each data to be modified...");

creating a modified executable code based on an internal representation of the component derived from an original executable code associated with the component (3:15 - 25, see renews); and

Although, Maebayashi doesn't explicitly disclose inserting the modified executable code into the online target system memory without taking the online target system offline, Maebayashi does show modifying the RAM 52, i.e. working program holding area with the modified program code using program data written into the EEPROM 54 (7:5 - 25). Berkley in an analogous art and similar configuration discloses dynamically (during runtime) inserting a code into an executable code. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Maebayashi and Berkley because, it would have made modifying the code on the fly and hence more dynamic.

Regarding claim 2, Maebayashi discloses all the claimed limitations as applied in claim 1 above. Maebayashi doesn't explicitly disclose wherein the modified executable code comprises a user mode code that executes in user mode. However Berkley does teach in an analogous art and similar configuration, allowing user to make modifications dynamically (Berkley, 5: 5 – 7). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Maebayashi and Berkley because, it enable users to make modifications dynamically.

Regarding claim 3, the computer-implemented method of Claim 2, wherein inserting the Modified executable code comprises:

- suspending one or more threads from processing on the target system (8: 45 - 53);

- if the modified executable code consumes more memory than the original executable code, injecting the modified executable code into the target system memory at a new memory location (18: 25 – 40);

- else, patching the modified executable code into the target system memory by overwriting an original memory area with the modified executable code, the original executable code being resident in the original memory area (6:25 – 50); and

- resuming the one or more threads for processing on the target system (8: 49 – 53, see restarting);

Regarding claim 4, the computer-implemented method of Claim 3, further comprising fixing a first thread out of the one or more threads if the first thread was

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suspended while executing a portion of the original executable code in the original memory area (3: 20 – 25, for fixing see modified).

Regarding claim 5, Maebayashi discloses all the claimed limitations as applied in claim 3 above as well as copying original executable code Maebayashi which Examiner interprets to be Maebayashi's limitation of storing a plurality of versions of code including the original versions (older) in a data store 2: 55 – 60, and pending on if it operates correctly being able to change the version to an older one see 11: 5 –10;

locating the new memory location for the modified executable code (2:63 –67);

writing the modified executable code to the target memory at the new memory location (FIG.1, parts 6, 9 & 11);

redirecting execution of the heterogeneous component to the modified executable code (4:38 – 40, see transfer command issuing unit, and modification data transfer path).

Regarding claim 8, the computer-implemented method of Claim 7, wherein inserting the modified executable code comprises:

replacing a first portion of the original executable code that resides in a first part of the original memory area with an instruction that disallows a thread from executing instructions in a second part of the original memory area (3: 5 –15, for disallow see abnormal stop unit);

replacing the second part of the original memory area with a portion of the modified executable code (3:16 –18); and

replacing the instruction in the first part of the original memory area with

another portion of the modified executable code, in manner such that the original memory area contains the modified executable code (3: 20 –25).

Regarding claim 9, the computer-implemented method of claim 1, further comprising determining whether the target system is a remote system, and if the target system is a remote system (15: 37 – 45), initiating a dynamic instrumentation process on the target system the enables communication with a tool residing on a local system that is performing the dynamic modifications to the heterogeneous program (1: 60 – 65, for dynamic instrumentation see, firmware modification comprising a processor executing a program).

Regarding claim 10, the computer-implemented method of claim 1, wherein the internal representation is derived from the original executable code that resides in the target system memory (2: 5 – 10).

Regarding claim 11, the computer-implemented method of Claim 1, wherein the internal representation is derived from the original executable code that resides on a local storage device (2: 7 – 10, see modification data storing unit).

Regarding claim 12, the computer-implemented method of claim 1, wherein the modified executable code comprises a procedure (for procedure, see Fig. 5).

Regarding claim 13, the computer-implemented method of claim 1, wherein the modified executable code comprises a basic block (2: 57 – 62, see blocks).

Regarding claim 14, the computer-implemented method of Claim 1, wherein the modified executable code comprises an instruction (Fig. 5, 104, see modification command).

Regarding claim 15, Maebayashi discloses a computerized system for modifying a heterogeneous program associated with an online target system without taking the target system offline, the system comprising:

- a processing unit (Fig. 1, 2);

- a system memory coupled to the processing unit through a system bus (Fig. 3, see bus handlers, 33);

- a computer-readable medium coupled to the processing unit through a system bus (Fig. 4, 54, see EEPROM);

- a hierarchical intermediate representation for a heterogeneous program residing in the system memory (Fig. 15, see firmware for intermediate representation, i.e., low level language);

- a transformation process executing in the processing unit for modifying the hierarchical intermediate representation to create a modified intermediate representation associated with the heterogeneous program (Fig. 16c, items 513 –515).

Although, Maebayashi doesn't explicitly disclose dynamic modification process executing in the processing unit for modifying an executable code in a target system memory based on the modified intermediate representation, without taking the target system, the executable code being associated with the heterogeneous program, Maebayashi does show modifying the RAM 52, i.e. working program holding area with the modified program code using program data written into the EEPROM 54 (7:5 - 25). Berkley in an analogous art and similar configuration discloses dynamically (during runtime) inserting a code into an executable code. Therefore it would have been

obvious to one of ordinary skill in the art at the time the invention was made to combine Maebayashi and Berkley because, it would have made modifying the code on the fly and hence more dynamic.

Regarding claim 16, which recites the system version of claim 3, see rationale as previously discussed above.

Regarding claim 17, which recites the system version of claim 5, see rationale as previously discussed above.

Regarding claim 18, which recites the system version of claim 8, see rationale as previously discussed above.

Regarding claim 19, the computer system of Claim 15, wherein the target system is a remote system (15: 37 – 45).

Regarding claim 20, which recites the computer readable medium version of claim 15, see rationale as previously discussed above.

5. Claims 6, 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maebayashi et al. USPN 5,450,589 as applied in claim 5, in view of Hammond USPN 6,463,583 B1.

Regarding claim 6, Maebayashi discloses all the claimed limitations as applied in claim 5 above. Although, Maebayashi doesn't explicitly disclose wherein redirecting execution includes writing a jump instruction in a first address of the original memory

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area, the jump instruction including an offset to the new memory location, he does mention a modification data transfer path 13, in 4:37 – 40, which is linked to the Modification holding unit which stores a plurality of versions of instructions as seen in FIG. 1. Hammond in an analogous art does disclose inserting a jump command in the original in 3: 5 – 25,

“ A jump command is inserted from the injection dynamic link library within the main dynamic link library function in the kernel dynamic link library to create a modified kernel dynamic link library in memory...The original kernel dynamic link library is replaced in memory with the modified kernel dynamic link library on the windowed operating system”.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine, Maebayashi and Hammond because, using jump a instruction or pointer to redirect or reference the update program would enable the system to more dynamically locate the modified instructions.

Regarding claim 7, Hammond further discloses the computer-implemented method of Claim 1, wherein the modified executable code comprises a kernel mode code that executes in kernel mode (Hammond, 3: 55 – 60).

Response to Arguments

6. Applicant's arguments with respect to claims 1 - 20 have been considered but are moot in view of the new ground(s) of rejection.

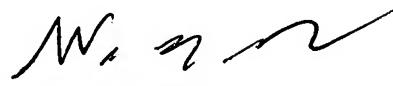
Correspondence information

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chuck Kendall whose telephone number is 571-272-3698. The examiner can normally be reached on 10:00 am - 6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Dam can be reached on 571-272-3695. The fax phone number for the organization where this application or proceeding is assigned is **571-273-8300**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ck.


WEI Y. ZHEN
PRIMARY EXAMINER